

Notice of Allowability

Application No.

10/785,006

Examiner

Henry S. Hu

Applicant(s)

GUARDA ET AL.

Art Unit

1713

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to Amendment of August 15, 2006.
2. ☒ The allowed claim(s) is/are 13 and 14.
3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☒ All b) ☐ Some* c) ☐ None of the:
 1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____

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EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in two telephone interviews with **Dawn C Russell** (Registration No. 44,751, tel. 202 857-6000) on September 27, 2006 to cancel the non-elected Claims 1-12 and also to amend Claim 14 as following:

Claim

Claims 1-12 please cancel Claims 1-12

Claim 14 at lines 7-8 please replace the formula of " $(\text{CF}_2)_2\text{COF}$ " with formula of " $(\text{CF}_2)_z\text{COF}$ " (two errors: add the "-" mark and then replace the number of "2" with "z")

DETAILED ACTION

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2. This Office Action is in response to **Amendment** filed on August 15, 2006. Both Claims 13 and 14 were rewritten into independent form as well as for better clarification; no claim was cancelled or added. Applicants have made all the corrections so as to overcome claim objections (a) and (b). Examiner thereby withdraws 112-2nd and 101 claim rejections as well as claim objections in the previous Non-Final Office Action dated May 15, 2006.

With above Examiner's amendment, all non-elected Claims 1-12 (Group I) were cancelled and the improper formula was corrected into " $-(CF_2)_2COF$ ". **Claims 13 and 14 are now pending** with two independent claims (Claim 13 and Claim 14). An action follows.

3. Claim rejections under **Non-Final** Office Action filed on May 15, 2006 are now removed for the reasons given in paragraphs 4-12 thereafter.

Allowable Subject Matter

4. Claims 13 and 14 are allowed.

5. The following is an examiner's statement of reasons for allowance: The above Claims 13 and 14 are allowed over the closest references:

6. *The limitation of parent Claim 13 in present invention relates to a process for lubricating in the presence of metals, comprising the step of applying linear*

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perfluoropolyethers as lubricants, wherein said linear perfluoropolyethers having a specific formula (I) as $T-O-(CF_2O)_n(CF_2CF_2O)_m(CF_2CF_2CF_2O)_r(CF_2CF_2CF_2CF_2O)_s-T_1$ with all the factors as specified in Claim 1.

Other parent Claim 14 is related to Claim 13 but with two extra limitations as: (A) also including “ $-(CF_2)_2COF$ ” for end groups T and T_1 , and (B) the total moles of the end groups have 0.5 to 50 mole% of $-COF$ groups.

7. Applicants have now claimed in each of the two twice-amended parent claims including Claim 13 and Claim 14 an unexpected way of obtaining a process of using a **perfluorinated** “linear” **polyether type** compound or polymer having a formula (I) as $T-O-(CF_2O)_n-(CF_2CF_2O)_m-(CF_2CF_2CF_2O)_r-(CF_2CF_2CF_2CF_2O)_s-T_1$ with all the four different perfluorooxy-alkylene units being statistically distributed (**in random type**) so as to be useful as **lubricants in the presence of metals**. The key point is that all four factors n, m, r, and s are very much specified in four conditions as: (A) **each of n, m, r and s is an integer** (not equal to zero) so as to make number average molecular weight to be in the range of 700-100,000, (B) **m/n is 2-20**, (C) **(r+s)/(n+m+r+s) is 0.05-0.2**, and (D) **m/(n+m+r+s) is 0.05-0.40**. Attention is directed to the importance of m/n must be fallen in such a range of 2-20 so as to obtain improved properties (see middle section of page 8). Parent Claim 14 is directly related to Claim 13 but with two extra limitations as: (A) also including “ $-(CF_2)_2COF$ ” for end groups T and T_1 , and (B) the total moles of the end groups have 0.5 to 50 mole% of $-COF$ groups.

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After a very close examination on Applicants' arguments on pages **8-10** of Remarks, the sole relying on two references including **Flynn** and **Scarati**, in combination or alone, to teach the use of PFPE with the claimed formula for lubricating cannot stand in both 102 and 103 rejections as following:

8. Firstly, **Flynn** has only used some PFPE type polymers which are related to a general formula of $A[-(C_yF_{2y})-O-(C_4H_8O)_k-(C_3F_6O)_m-(C_2F_4O)_n-(CF_2O)_p-(C_zF_{2z})-]A'$. In the case of Fomblin Z as pointed out by Applicants, Flynn's **m/n is less than 2, with is outside the claimed range of 2-20** (see middle section of page 9). Additionally, Flynn's repeating units are **both linear and branched** (see bottom section of page 8).

9. Secondly, the PFPEs in **A4 class** as disclosed by Scarati may have incorporated **a combination of all four claimed repeating units including -C₂F₄O-, -CF₂O-, -CF₂CF₂CF₂O- and -CF₂CF₂CF₂CF₂O-** in the polymeric chain. However, same problem is existed. Therefore, it would be NOT obvious to obtain some of **Scarati's A4 compounds with repeating units randomly distributed** so as to read on the claimed linear perfluoropolyethers and also with four specified limitations on the factors n, m, r and s. Again, **Scarati does not realize the importance of using a ratio of m/n at 2-20.**

10. Additionally, the present invention has shown **unexpected results** in examples along with some comparative examples for making such PFPE compound or polymer for lubricating (see pages 11-22 for **examples 1-10, comparative examples 11-12** and see international search

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report in priority paper **EP 1,454,938 A1** with no X or Y reference). Therefore, all the above-mentioned references, in combination or alone, does not teach or fairly suggest the limitations of present invention.

11. After further examination and search, the examiner found the following prior art did not teach the claimed limitation: **US Patent No. 6,509,509 B2 to Tonelli et al.** only discloses a process for using the perfluoropolyoxyalkylenes **with one or two hydroxyl end groups** to be as lubricants (see title; abstract, line 1-8; column 1, line 23). Although mono-functional and/or bifunctional PFPEs may contain **“some”** of the claimed perfluorooxyalkylene repeating units as well as may be applied to the same application as **lubricant** (column 1, line 23), it requires at least one of the end groups to be -CH₂OH. Additionally, **Tonelli does not realize the importance of using a ratio of m/n at 2-20.** Therefore, Tonelli fails to teach or fairly suggest the claimed linear PFPEs of present invention.

12. The key issue on the ratio of m/n being 2-20 in making a PFPE having a formula of T-O-(CF₂O)_n-(CF₂CF₂O)_m-(CF₂CF₂CF₂O)_r-(CF₂CF₂CF₂CF₂O)_s-T₁, cannot be overcome by any or the combination of the above references, therefore, the present invention is novel.


13. As of the date of this office action, the examiner has not located or identified any reference that can be used singularly or in combination with another reference including the above references to render the present invention anticipated or obvious to one of the ordinary

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skill in the art. Therefore, the two independent and parent **Claim 13 and Claim 14** are both allowed for the reason listed above.

14. Any inquiry concerning this communication or earlier communication from the examiner should be directed to **Dr. Henry S. Hu** whose telephone number is **(571) 272-1103**. The examiner can be reached on Monday through Friday from 9:00 AM –5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu, can be reached on (571) 272-1114. The fax number for the organization where this application or proceeding is assigned is (571) 273-8300 for all regular communications. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Henry S. Hu

Patent Examiner, art unit 1713, USPTO

September 27, 2006



DAVID W. WU
ASSISTANT PATENT EXAMINER
BIOLOGY CENTER 1700